Lecture Notes

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Class: 11th

Topic(s): Ecological Succession; its Causes and Types

Q. Write a descriptive note on:

A. Ecological succession

B. Causes of Ecological Succession

C. Types of Ecological succession

Ans.

A. Ecological Succession

Definition:

Ecological succession is the series of changes in an ecosystem when one community is replaced by another community as a result of changes in biotic and abiotic factors. or

"Development of different communities of living organismsone after the other over the same area in the course of time."

Explaination:

Change is the law of nature and nature itself follows the same law. Tnis is evident by dynamicity of nature. We can observe or find evidence that where we have very fertile lands now were barren or deserts. The reverse is also true. Some plants or animals that inhabited a particular area are no more living there. In the same way, new aninmals and plants have started living new places, which are other than the natural habitat or are new habitats. This means communities of living organisms (plants and animals) replace one another in a very systematic, predictable and orderly sequence. This process of community change is ecological succession.

The term, "Ecological Succession' was used by Hult (1855) during the studyof a community of southern Sweden. Two botanists Warming (1896) and Cowles (1899)developed a clear concept of ecological succession. Mishra, Rangnathan, Champion,Suri, Pandey and Sharma are the renowned ecologists of India.

B. Causes of Ecological Succession.

(a) Clinmatic causes. An ecosystem does not remain stable when the climaticconditions change. This change in climate results in partial or total destruction of the vegetation and develops bare area. Common changes in climate, whichcan affect an ecosystem, adversely are drought, heavy snowfall and lightenming.

(b) Topographic cause. Most common topographic causes responsible for ecological succession are erosion of soil, dep0sition of soil, change in nature of soil (from acidic to alkaline or from alkaline to acidic), etc. Soil erosion is removal of upper tertile layers of soil by action of water or wind. The soil left after erosion cannot supplement growth of vegetation or plants. Thus, the land becomes barren. This is the start of ecological succession. Soil deposition is opposite to soil erosion. Heavy storms, glaciers, snowfall and landslides may bring the tertile sOll irom outside the ecosystem and deposit it in the given ecosystem. After deposition of soil, the vegetation or the plants may get, destroyed or suppressed. This soil deposition results in a new bare area on which succession initiates.

(c) Biotic causes. The ecological succession is, caused by activities of other living organisms. Such causes are, known as biotic causes. Many biological agencies (animals and humans) can also work for destruction or suppression of the vegetation in many ways. Some of the activities like too much grazing, cutting of trees, cultivation of new crops, and excessive harvesting, etc. are directly responsible for either vegetation change or destruction. Almost all these activities are result of human activities. Many parasitic plants and animals also destroy the vegetation and can make an overly vegetated area as bare area.

C. Types of Ecological Succession.

1. Primary Succession. Succession taking place on a barren area having no vegetation is primary succession. Common examples of primary Succession are succession occurring on rocky surfaces, sandy layer and in ponds and lakes

2. Secondary succession. Succession taking place on an area, which previously was full of vegetation but became barren, due to some reasons secondary Succession. Common examples of secondary succession are succession taking place on abandoned farmland, strip mines, roadsides and landhll areas.

3. Climax succession. This is the last stage of succession. At this stage, the ecosystem 1s having and maintaining ecological balance. The components of the ecosystem live in harmony and there are little or no chances of migration.

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More types:

On the basis of dominating individuals:

1. Autotrophic succession. This type of succession 1s, characterized by earlyy and continued dominance of autotrophic organisms.

2. Heterotrophic succession. This type of succession is, characterised by early and continued dominance of heterotrophic organism.

Based on the factors responsible:

1. Autogenic Succession. When organisms react with the environment and change 1it, causing its own replacement by new communities it is, called autogenic succession.

2. Allogenic Succession. When the replacement of existing community 1s,caused by external conditions and not by the existing community, then it is named as allogenic succession.

The End.